FIG. 1

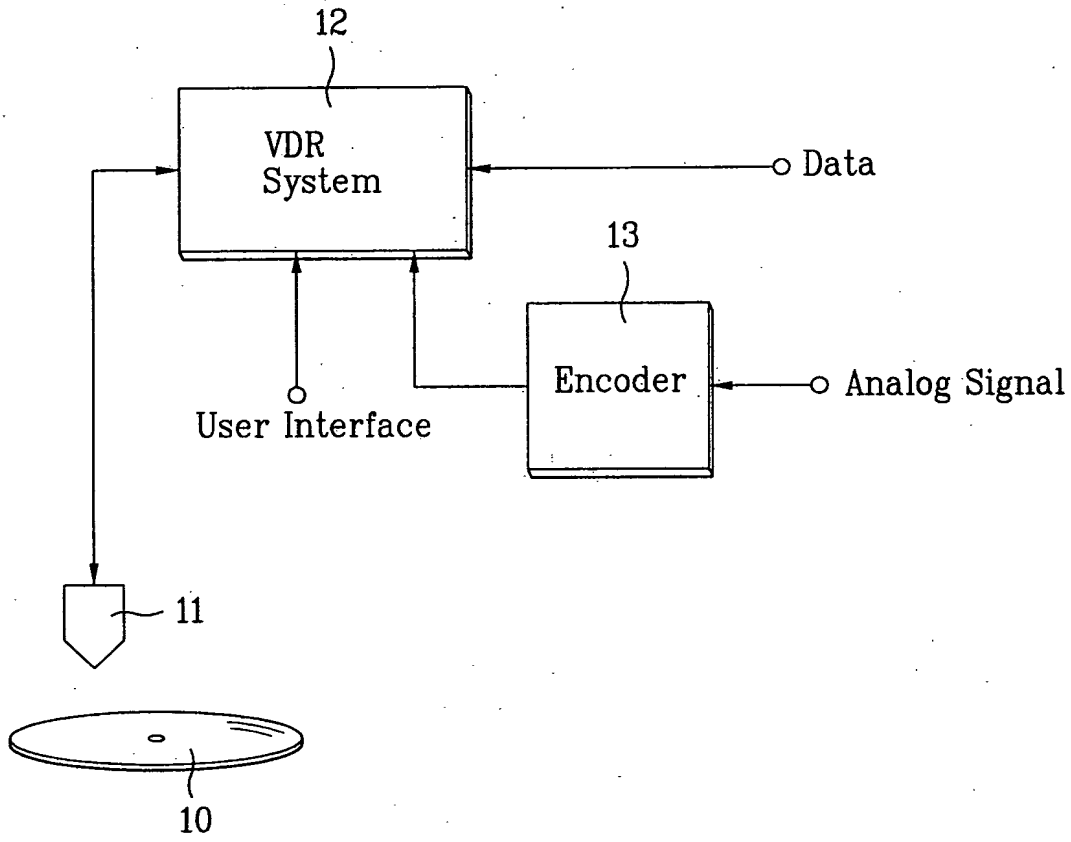

12
VDR
System
Data
13
Encoder
Analog Signal
User Interface
11
10

FIG. 2

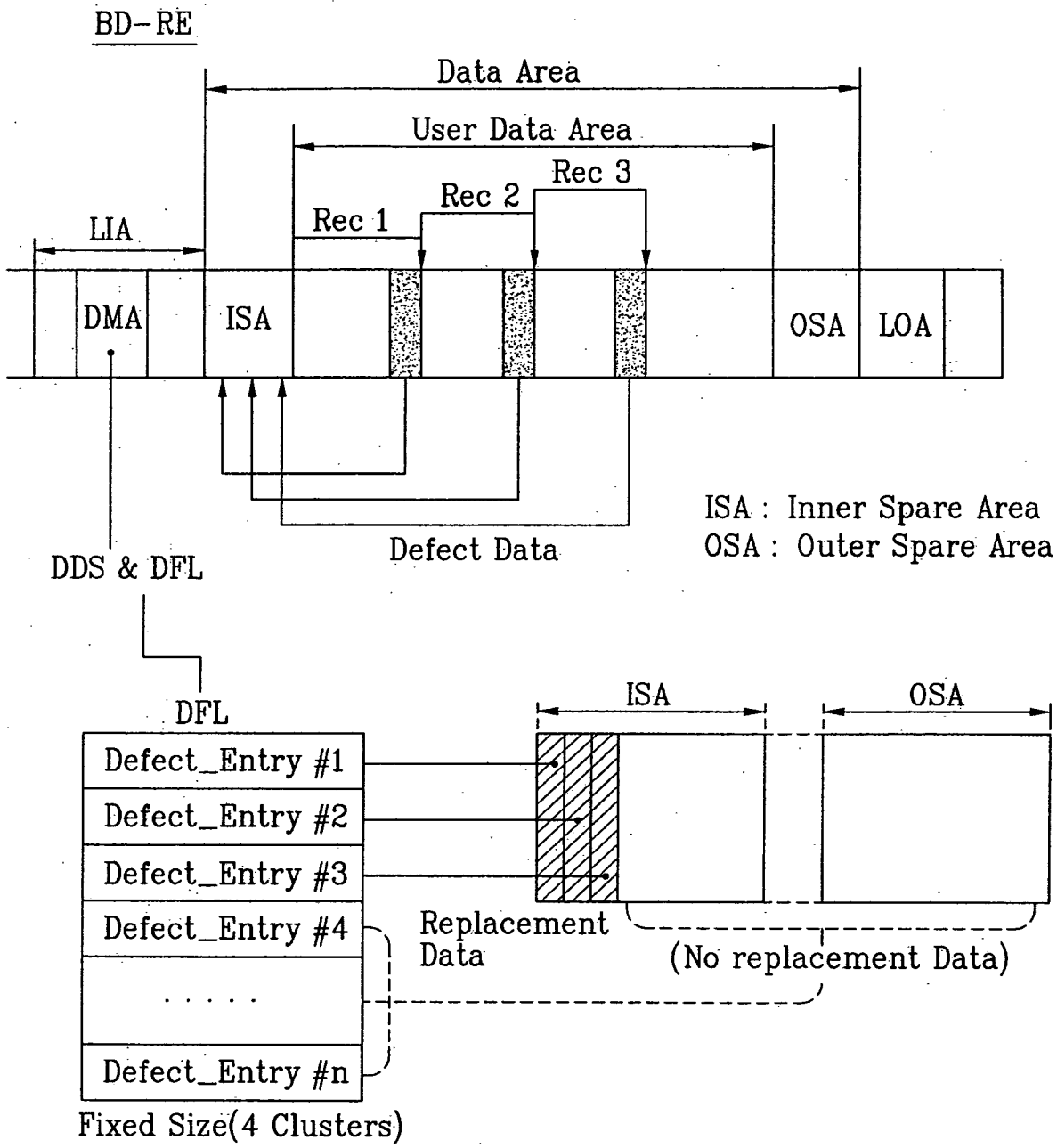

BD-RE
Data Area
User Data Area
Rec 3
Rec 2
Rec 1
LIA
DMA
ISA
OSA
LOA
Defect Data
ISA : Inner Spare Area
OSA : Outer Spare Area
DDS & DFL
DFL
Defect_Entry #1
Defect_Entry #2
Defect_Entry #3
Defect_Entry #4
. . . . .
Defect_Entry #n
Fixed Size(4 Clusters)
ISA
OSA
Replacement Data
(No replacement Data)

FIG. 3

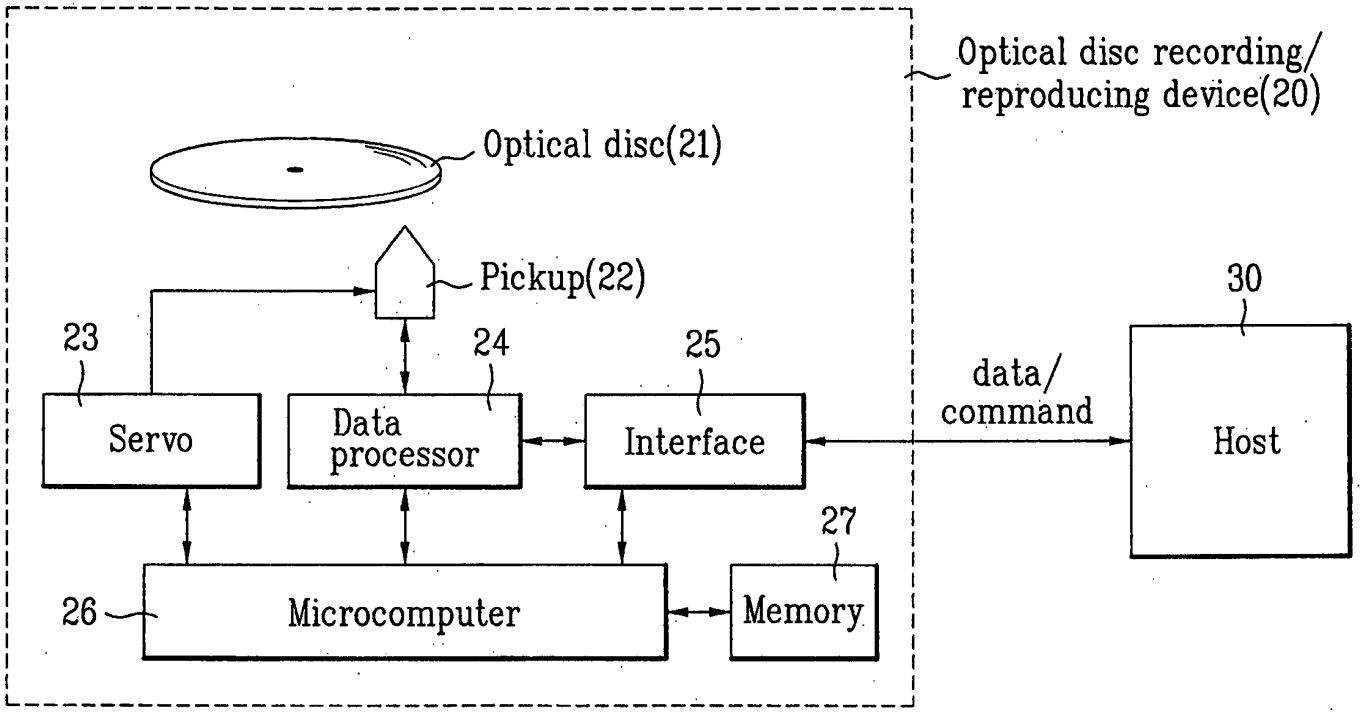

Optical disc recording/
reproducing device(20)
Optical disc(21)
Pickup(22)
23
24
25
30
Servo
Data
processor
Interface
data/
command
Host
27
26
Microcomputer
Memory

FIG. 4A

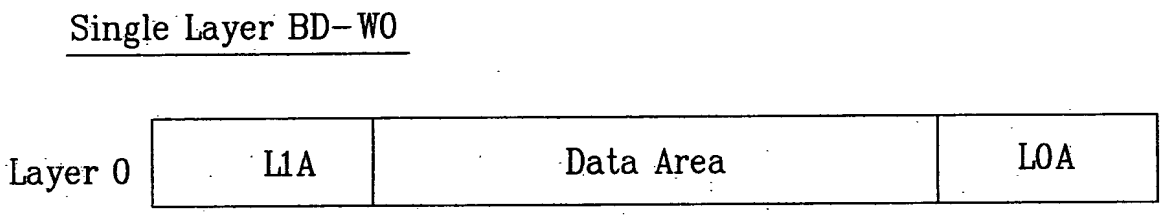

Single Layer BD-WO
Layer 0
L1A
Data Area
L0A

FIG. 4B

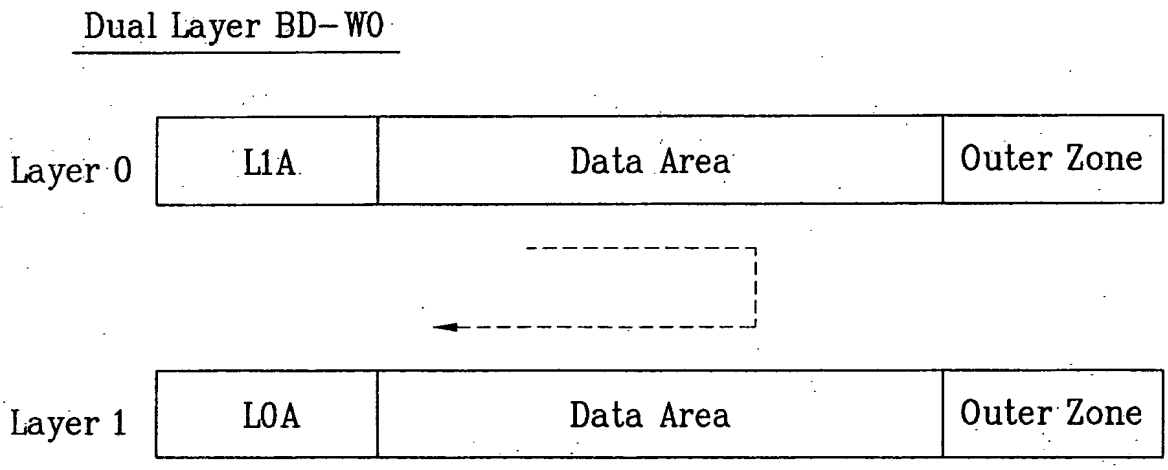

Dual Layer BD-WO
Layer 0
L1A
Data Area
Outer Zone
Layer 1
L0A
Data Area
Outer Zone

FIG. 5

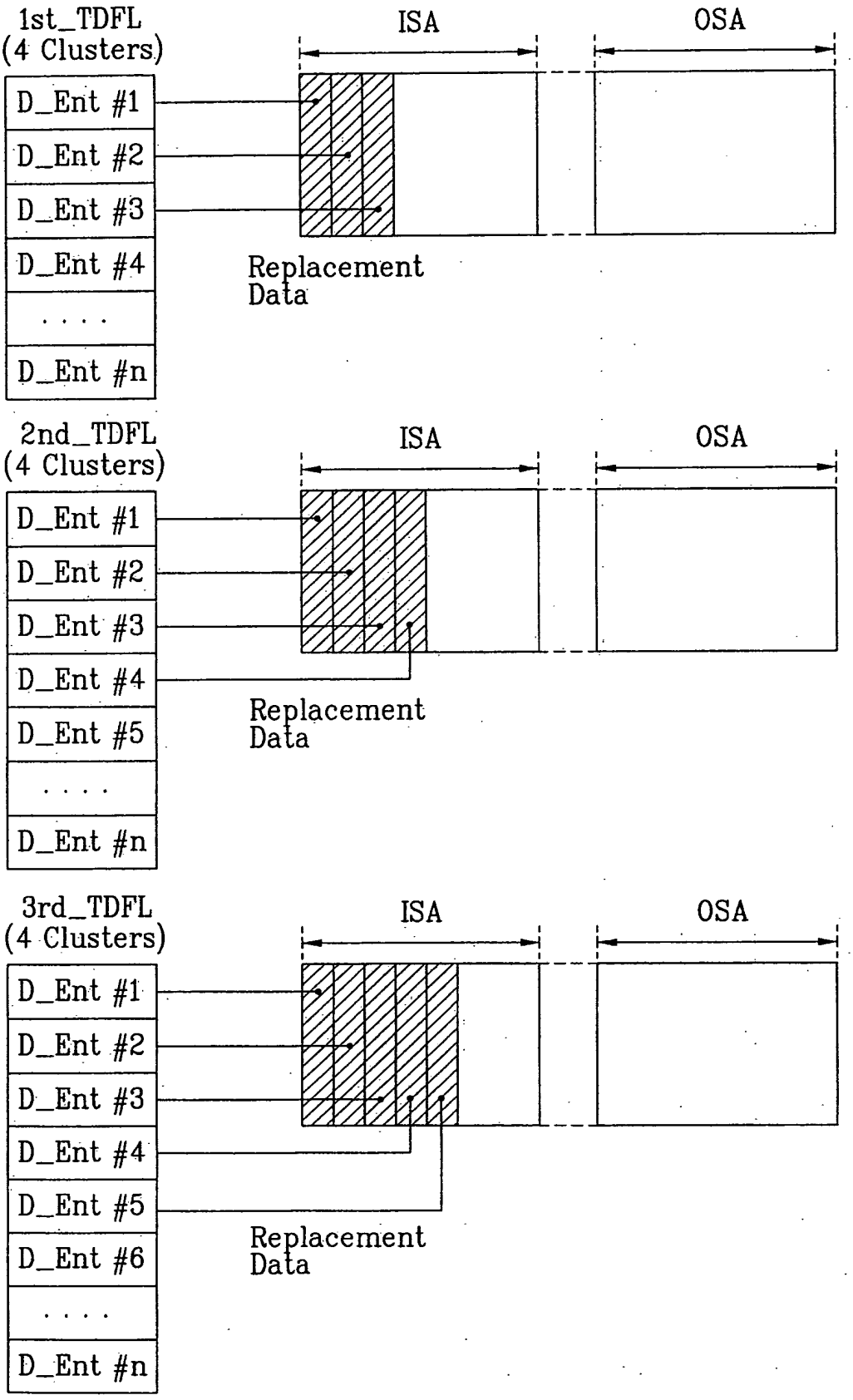

1st_TDFL
(4 Clusters)
D_Ent #1
D_Ent #2
D_Ent #3
D_Ent #4
. . . .
D_Ent #n
ISA
OSA
Replacement
Data
2nd_TDFL
(4 Clusters)
D_Ent #1
D_Ent #2
D_Ent #3
D_Ent #4
D_Ent #5
. . . .
D_Ent #n
ISA
OSA
Replacement
Data
3rd_TDFL
(4 Clusters)
D_Ent #1
D_Ent #2
D_Ent #3
D_Ent #4
D_Ent #5
D_Ent #6
. . . .
D_Ent #n
ISA
OSA
Replacement
Data

FIG. 6

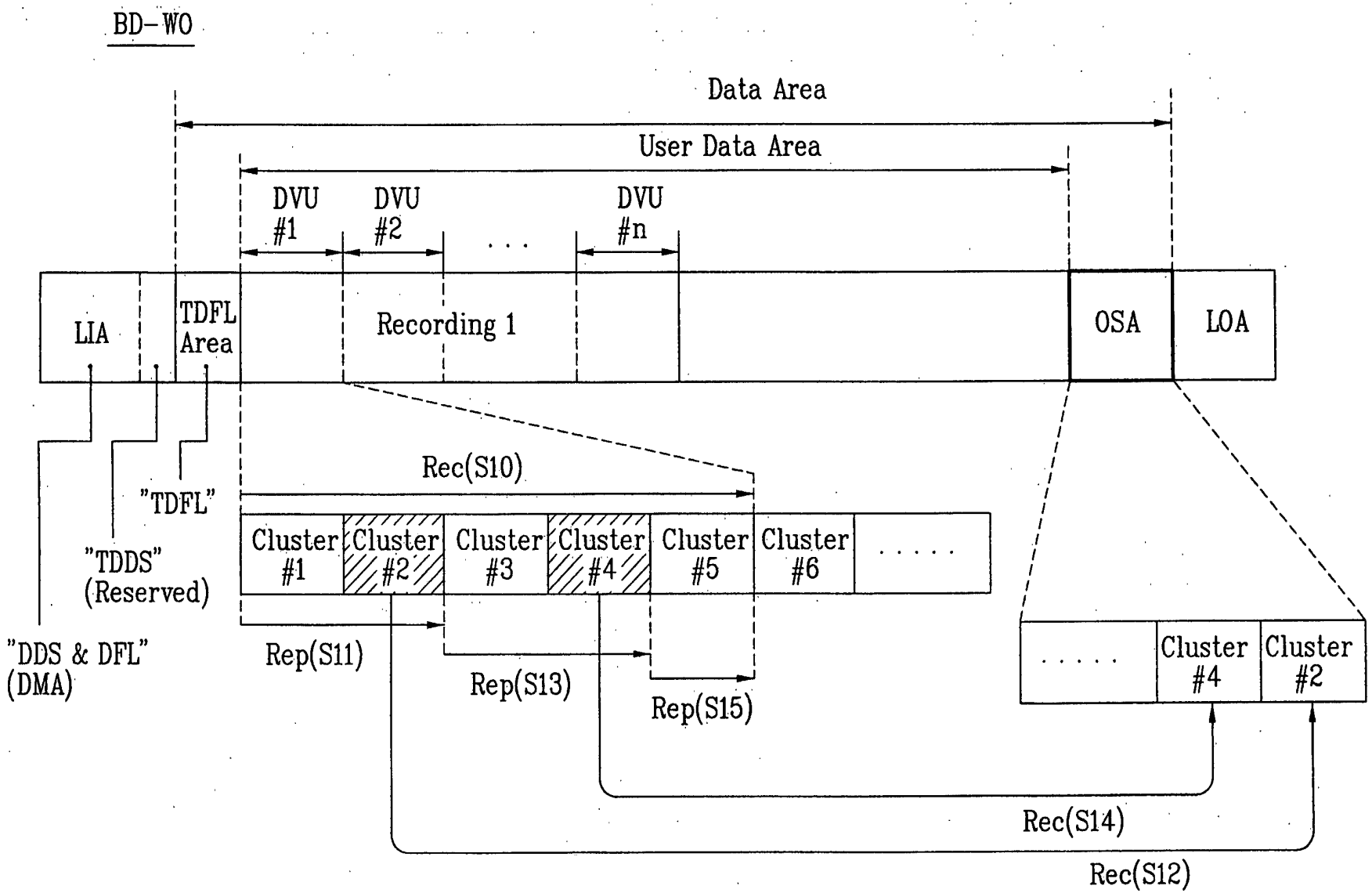

BD-WO
Data Area
User Data Area
DVU #1
DVU #2
DVU #n
LIA
TDFL Area
Recording 1
OSA
LOA
Rec(S10)
"TDFL"
"TDDS" (Reserved)
"DDS & DFL" (DMA)
Cluster #1
Cluster #2
Cluster #3
Cluster #4
Cluster #5
Cluster #6
Rep(S11)
Rep(S13)
Rep(S15)
Cluster #4
Cluster #2
Rec(S14)
Rec(S12)

FIG. 7

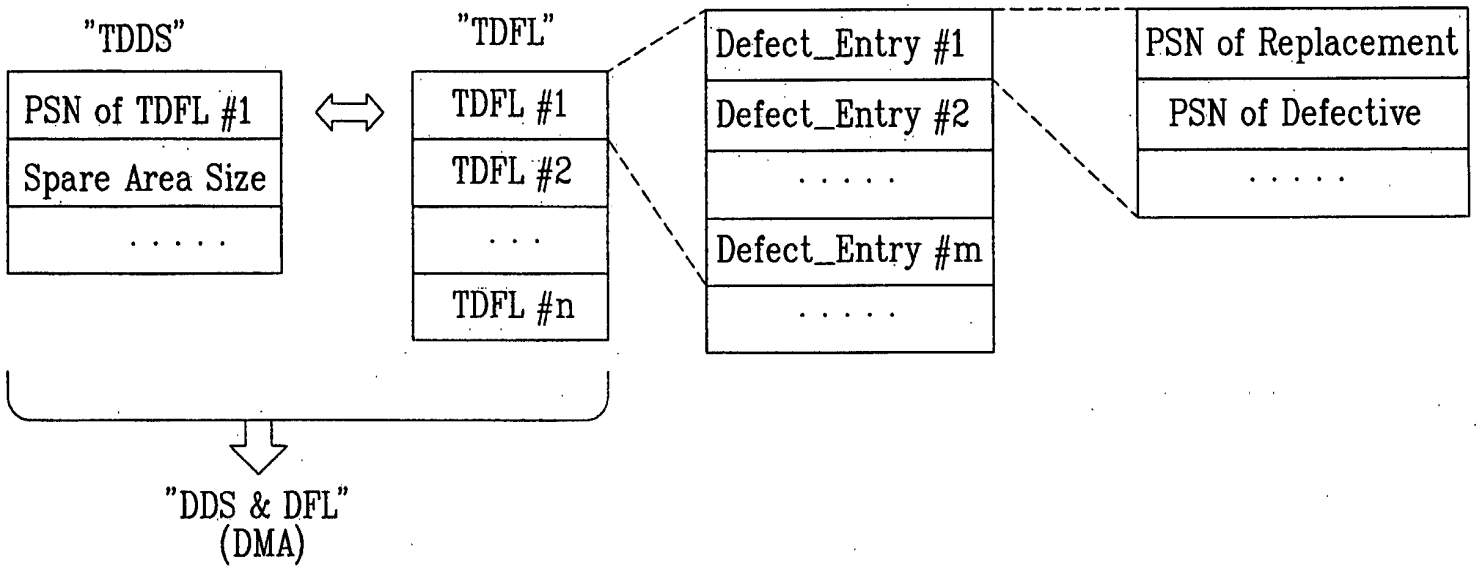

"TDDS"
PSN of TDFL #1
Spare Area Size
. . . . .
"TDFL"
TDFL #1
TDFL #2
. . .
TDFL #n
Defect_Entry #1
Defect_Entry #2
. . . . .
Defect_Entry #m
. . . . .
PSN of Replacement
PSN of Defective
. . . . .
"DDS & DFL"
(DMA)

FIG. 8

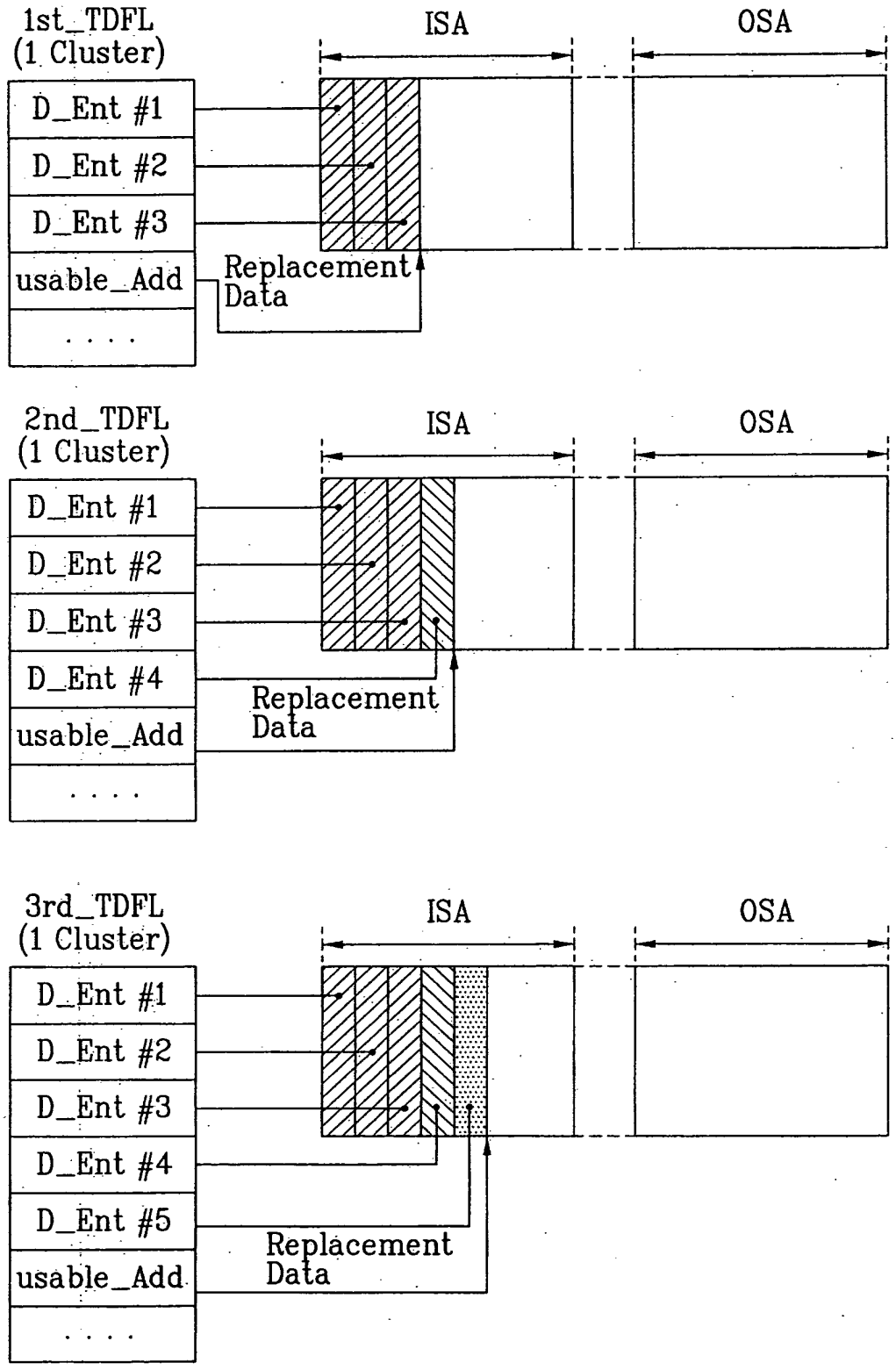

1st_TDFL
(1 Cluster)
D_Ent #1
D_Ent #2
D_Ent #3
usable_Add
. . . .
ISA
OSA
Replacement
Data
2nd_TDFL
(1 Cluster)
D_Ent #1
D_Ent #2
D_Ent #3
D_Ent #4
usable_Add
. . . .
ISA
OSA
Replacement
Data
3rd_TDFL
(1 Cluster)
D_Ent #1
D_Ent #2
D_Ent #3
D_Ent #4
D_Ent #5
usable_Add
. . . .
ISA
OSA
Replacement
Data

FIG. 9

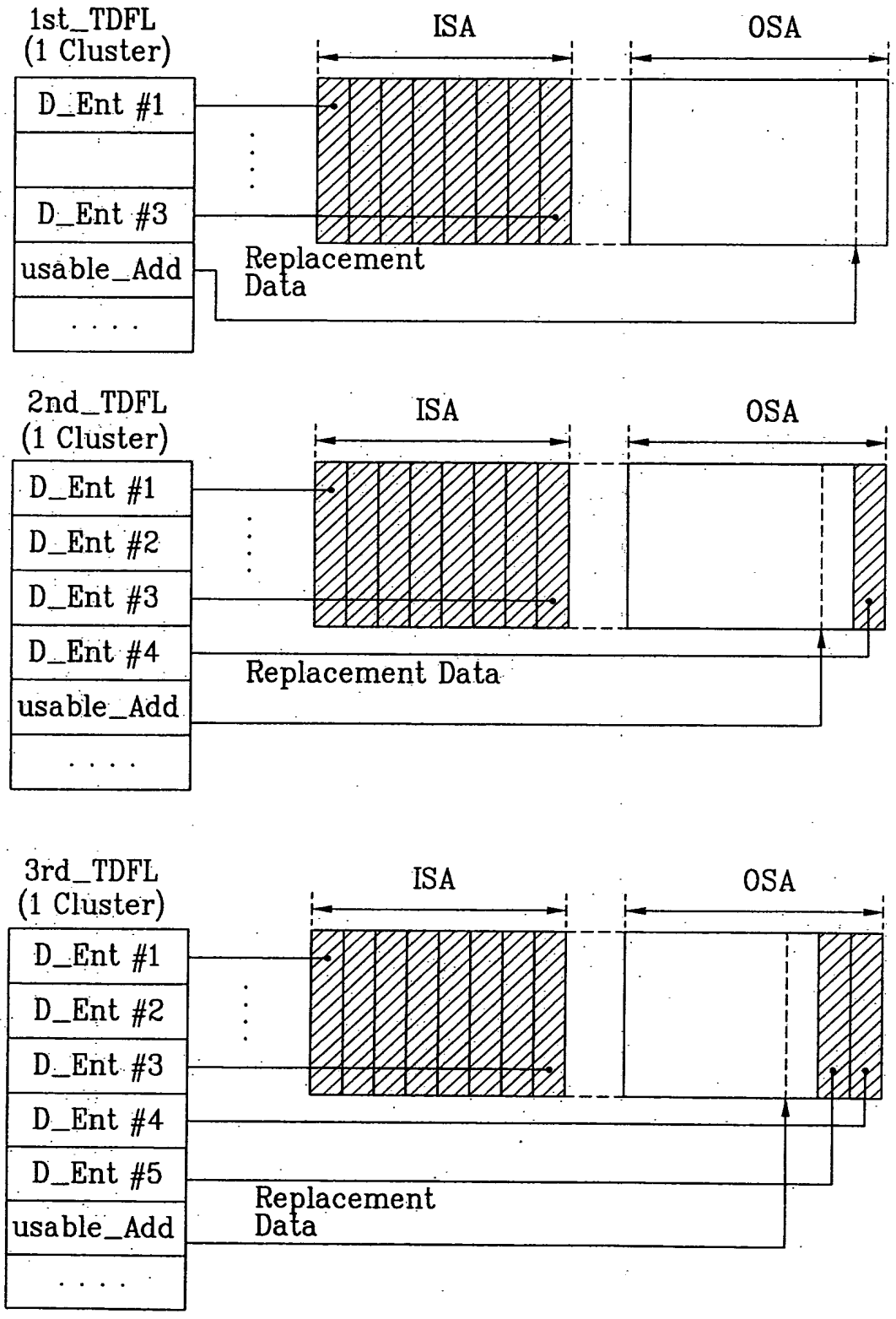

1st_TDFL
(1 Cluster)
D_Ent #1
D_Ent #3
usable_Add
. . . .
ISA
OSA
Replacement
Data
2nd_TDFL
(1 Cluster)
D_Ent #1
D_Ent #2
D_Ent #3
D_Ent #4
usable_Add
. . . .
ISA
OSA
Replacement Data
3rd_TDFL
(1 Cluster)
D_Ent #1
D_Ent #2
D_Ent #3
D_Ent #4
D_Ent #5
usable_Add
. . . .
ISA
OSA
Replacement
Data

FIG. 10

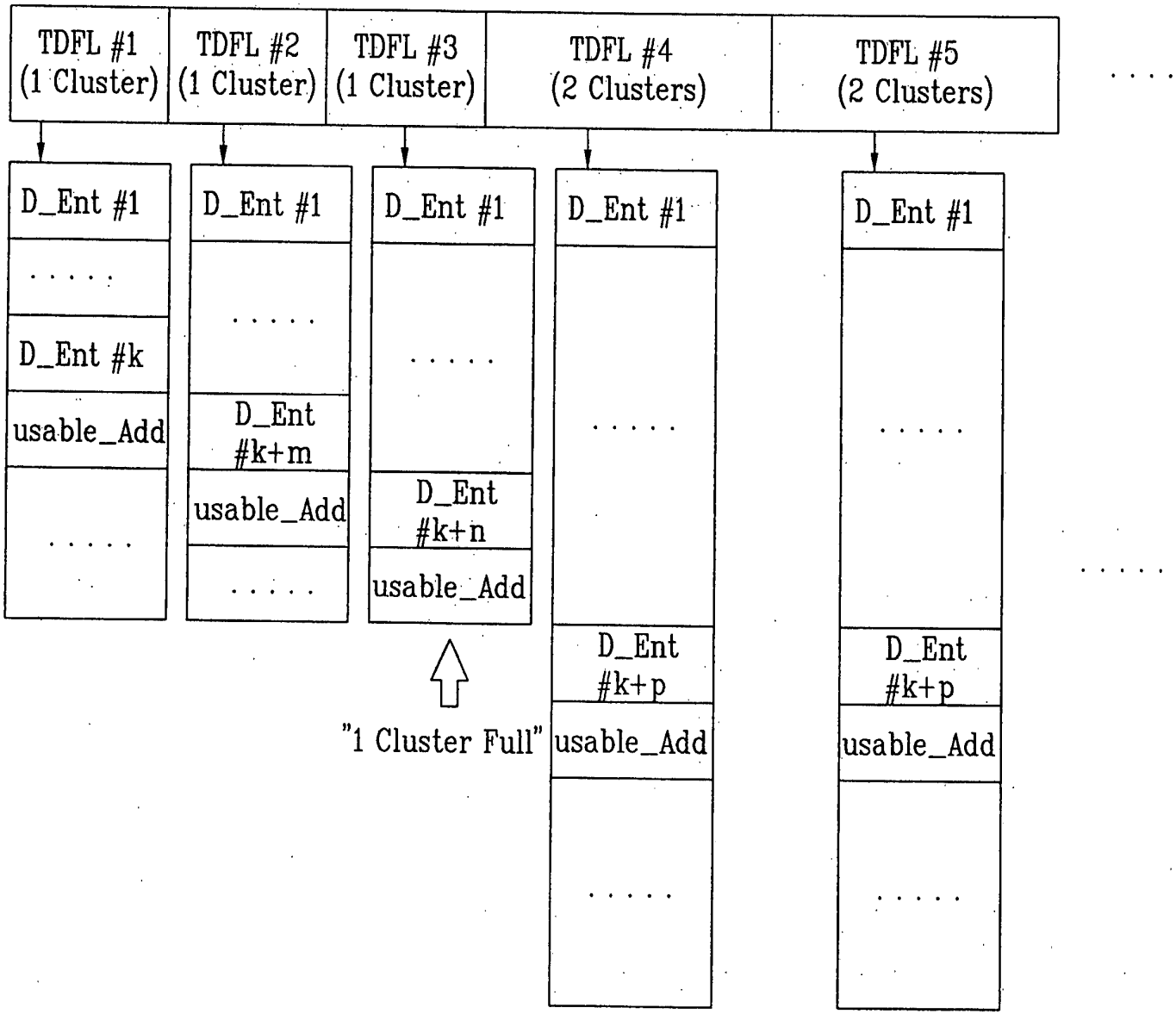

TDFL #1
(1 Cluster)
TDFL #2
(1 Cluster)
TDFL #3
(1 Cluster)
TDFL #4
(2 Clusters)
TDFL #5
(2 Clusters)
D_Ent #1
D_Ent #k
usable_Add
D_Ent #1
D_Ent #k+m
usable_Add
D_Ent #1
D_Ent #k+n
usable_Add
"1 Cluster Full"
D_Ent #1
D_Ent #k+p
usable_Add
D_Ent #1
D_Ent #k+p
usable_Add

FIG. 11

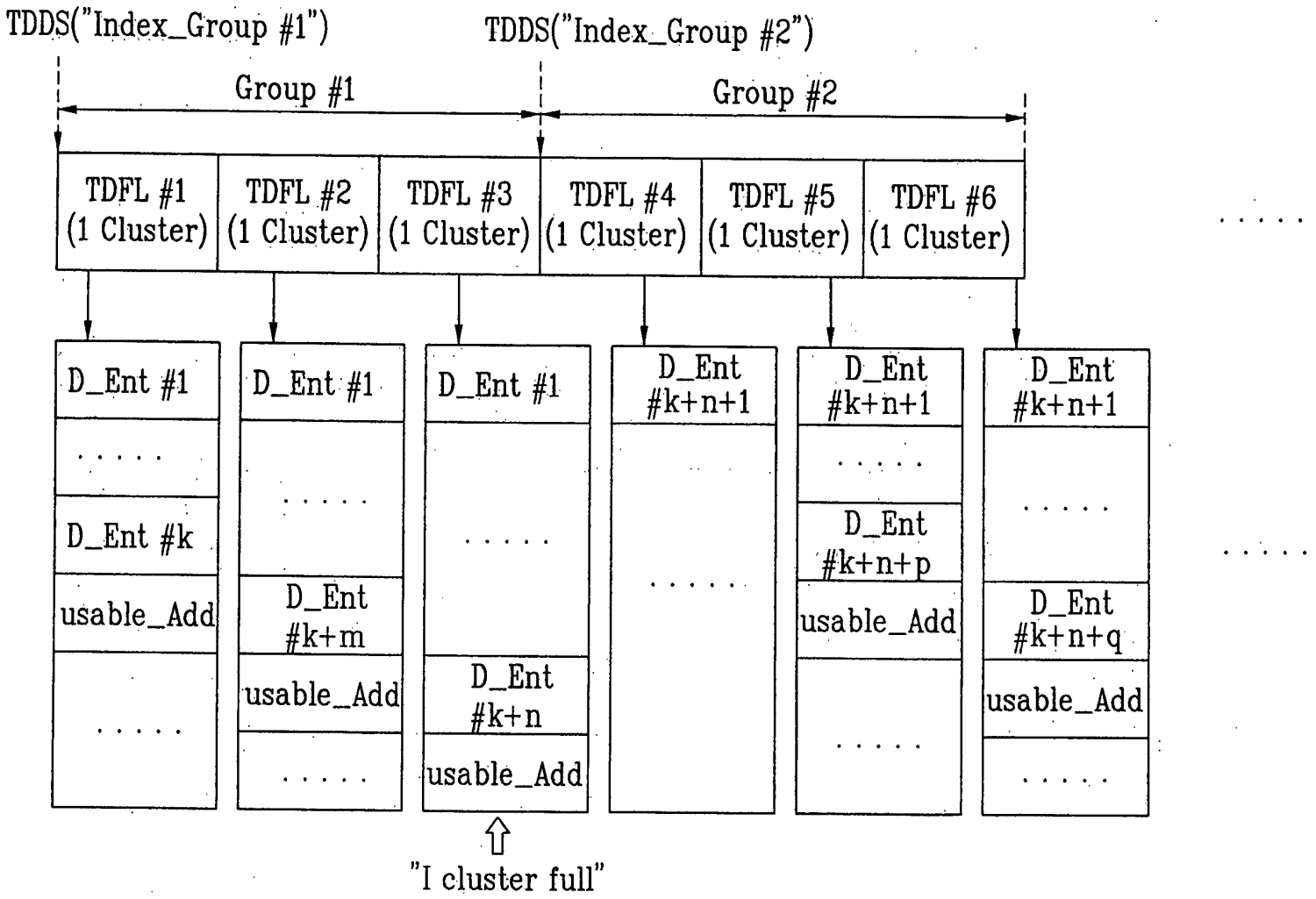

TDDS("Index_Group #1")
TDDS("Index_Group #2")
Group #1
Group #2
TDFL #1 (1 Cluster)
TDFL #2 (1 Cluster)
TDFL #3 (1 Cluster)
TDFL #4 (1 Cluster)
TDFL #5 (1 Cluster)
TDFL #6 (1 Cluster)
D_Ent #1
D_Ent #k
usable_Add
D_Ent #1
D_Ent #k+m
usable_Add
D_Ent #1
D_Ent #k+n
usable_Add
D_Ent #k+n+1
D_Ent #k+n+1
D_Ent #k+n+p
usable_Add
D_Ent #k+n+1
D_Ent #k+n+q
usable_Add
"I cluster full"

FIG. 12

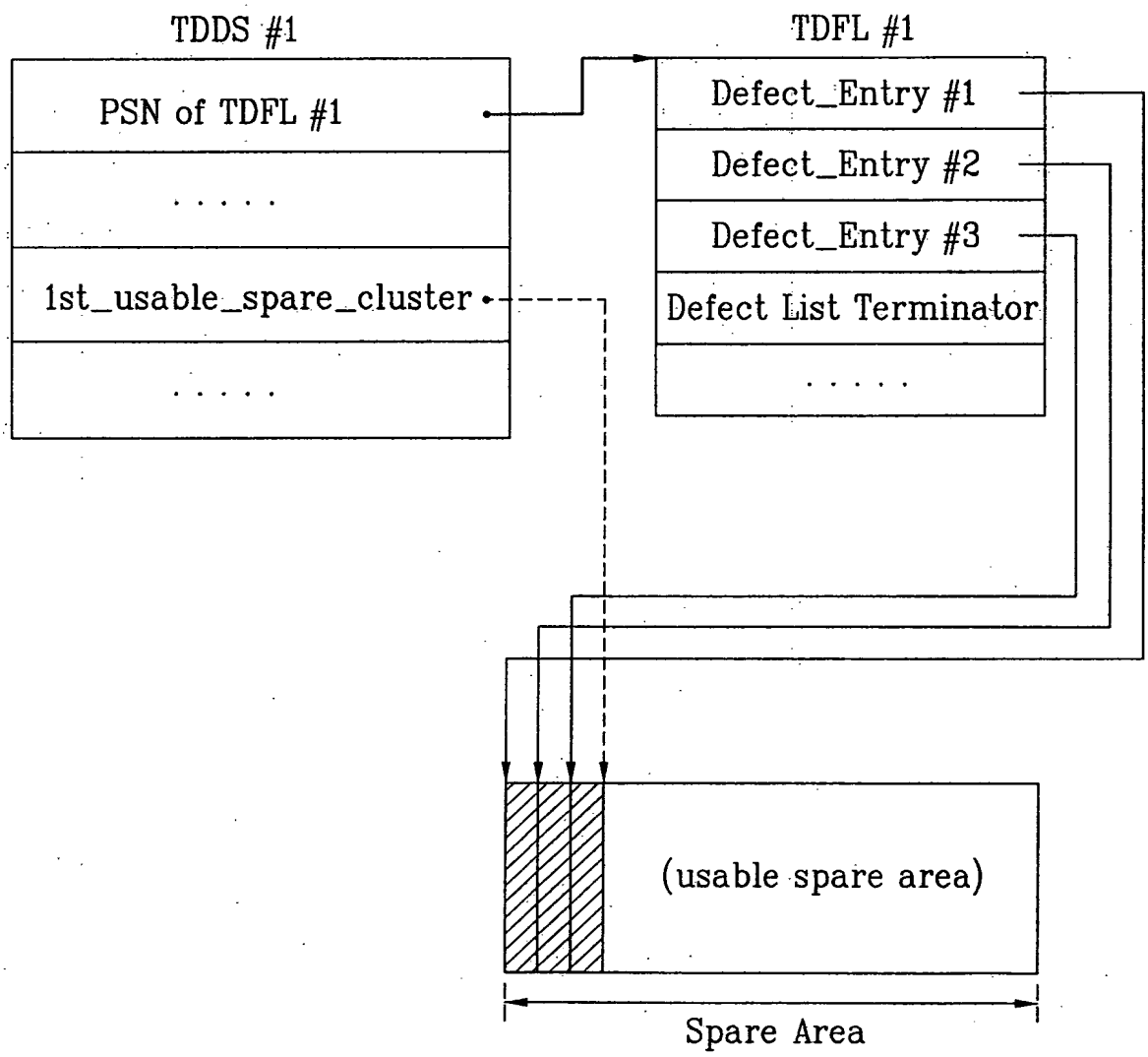

TDDS #1
PSN of TDFL #1
. . . . .
1st_usable_spare_cluster
. . . . .
TDFL #1
Defect_Entry #1
Defect_Entry #2
Defect_Entry #3
Defect List Terminator
. . . . .
(usable spare area)
Spare Area

FIG. 13

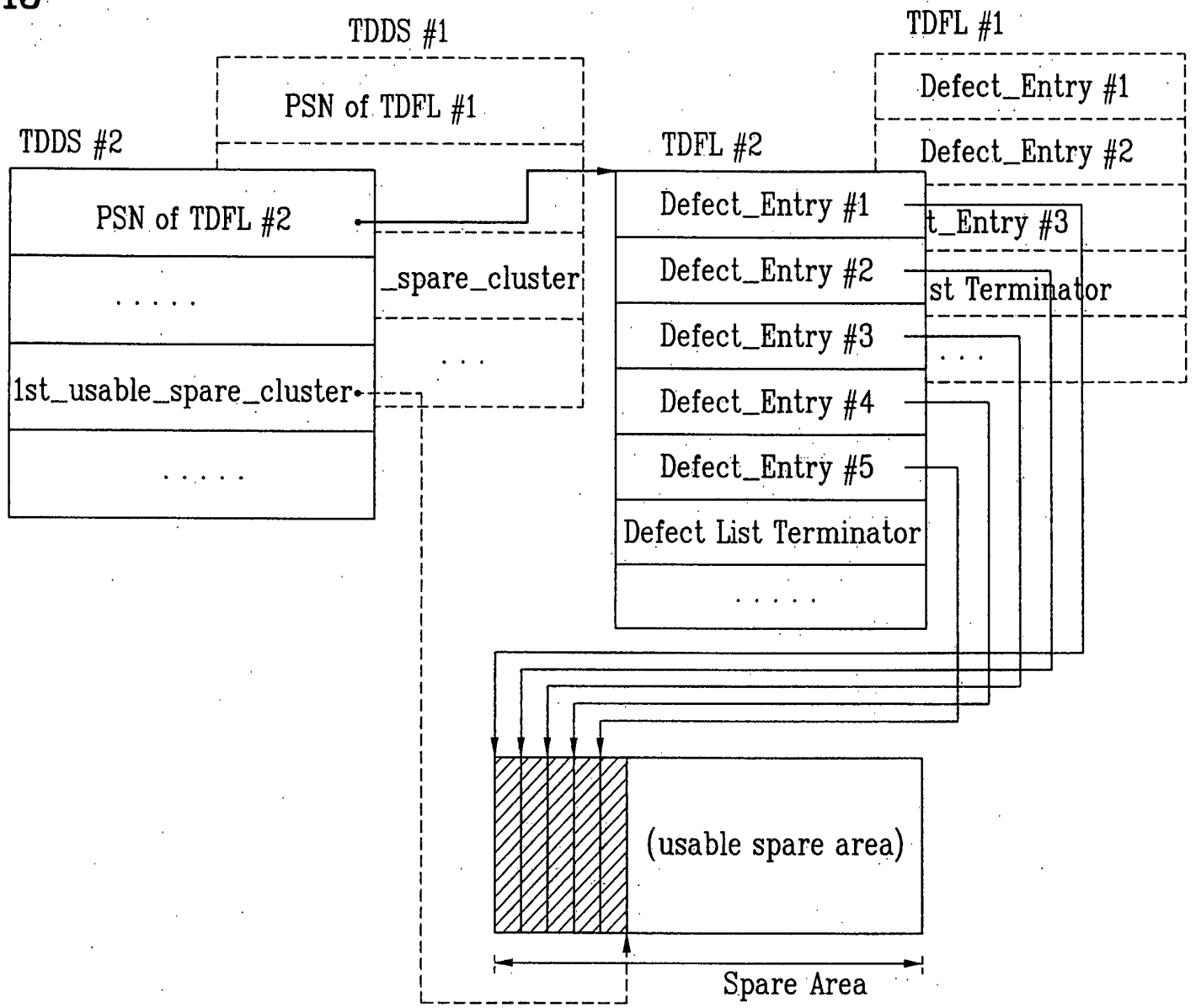

TDDS #1
PSN of TDFL #1
TDDS #2
PSN of TDFL #2
. . . . .
1st_usable_spare_cluster
. . . . .
_spare_cluster
. . .
TDFL #1
Defect_Entry #1
Defect_Entry #2
t_Entry #3
st Terminator
. . .
TDFL #2
Defect_Entry #1
Defect_Entry #2
Defect_Entry #3
Defect_Entry #4
Defect_Entry #5
Defect List Terminator
. . . . .
(usable spare area)
Spare Area

FIG. 14

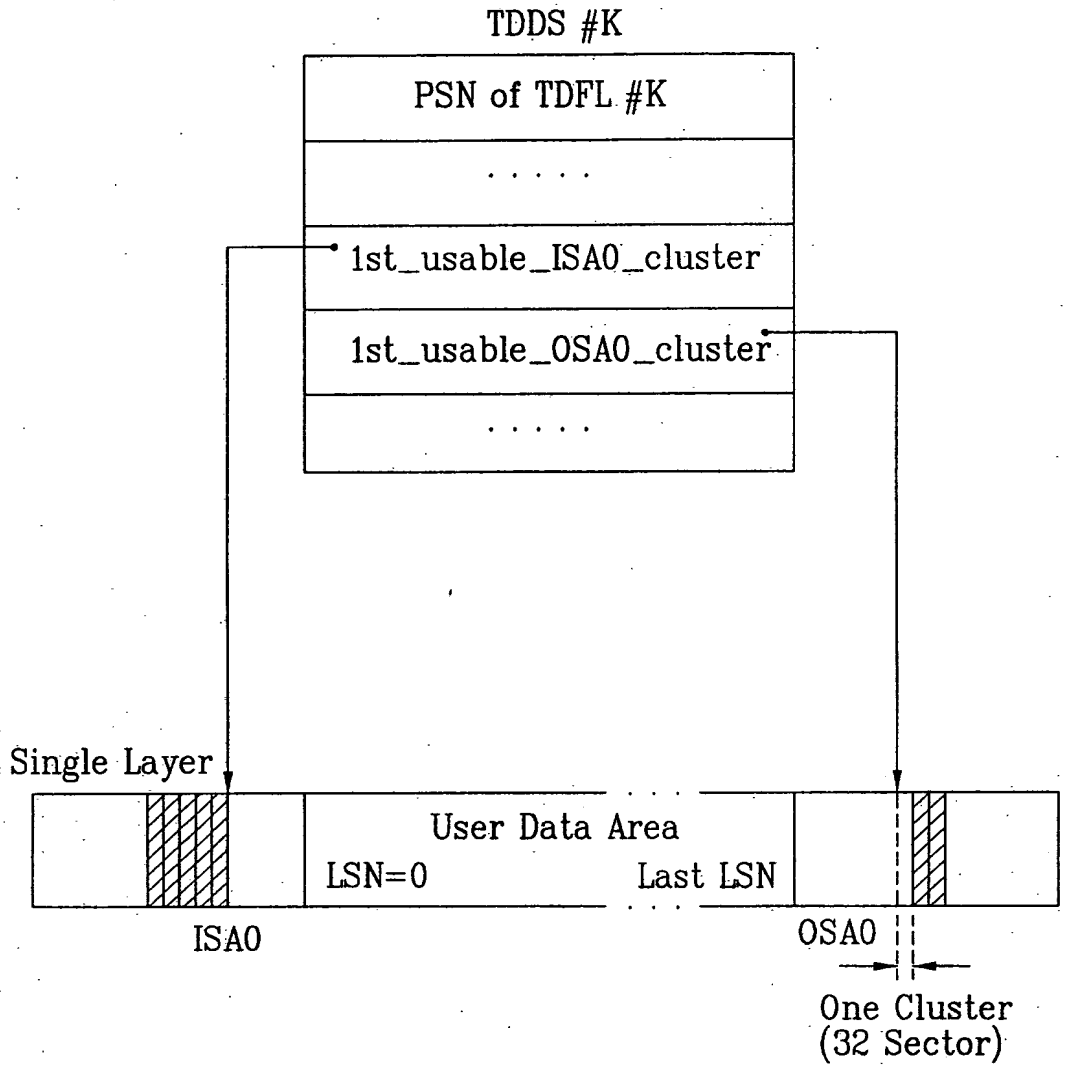

TDDS #K
PSN of TDFL #K
. . . . .
1st_usable_ISA0_cluster
1st_usable_OSA0_cluster
. . . . .
Single Layer
User Data Area
LSN=0
Last LSN
ISA0
OSA0
One Cluster
(32 Sector)

FIG. 15

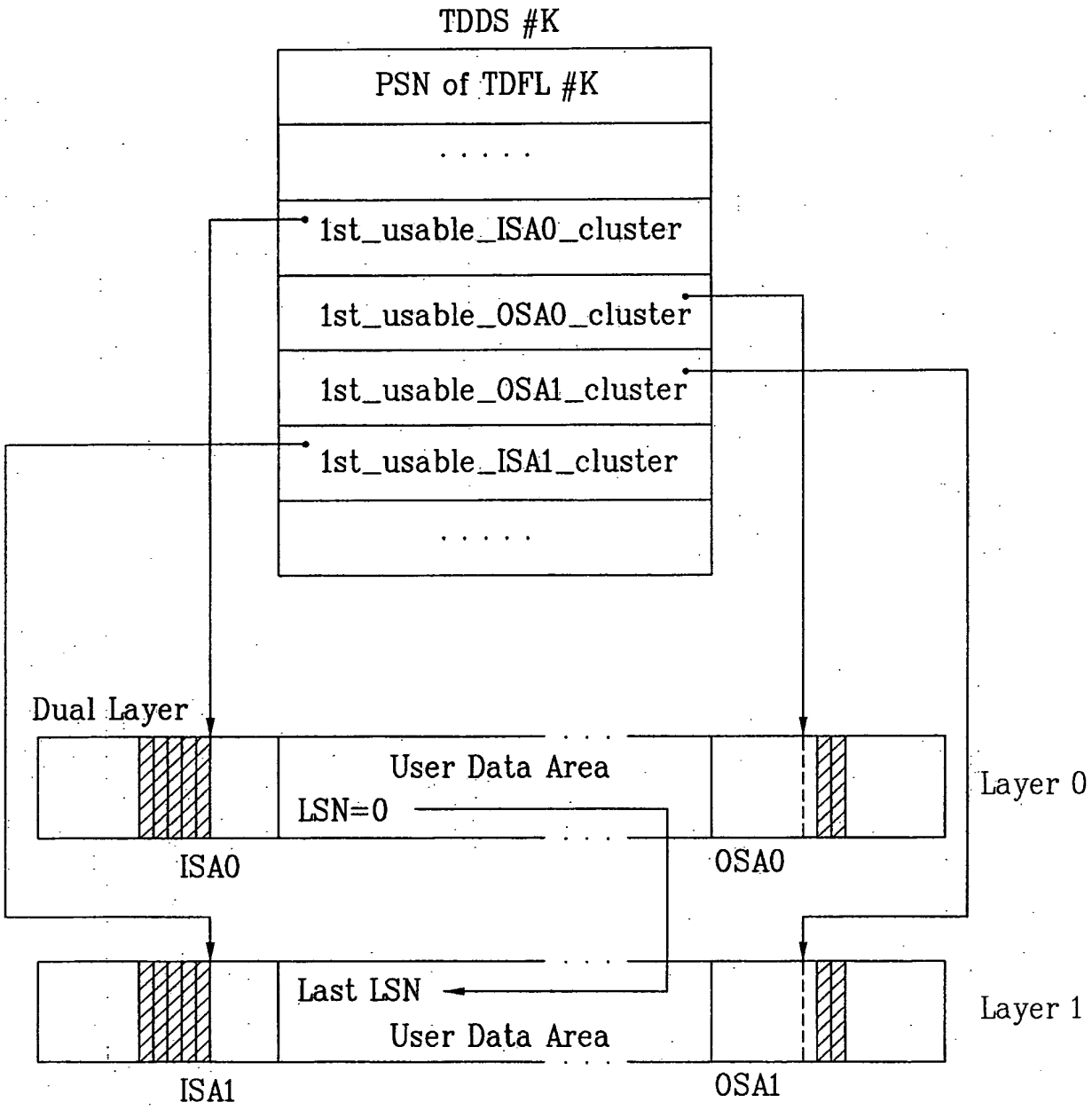
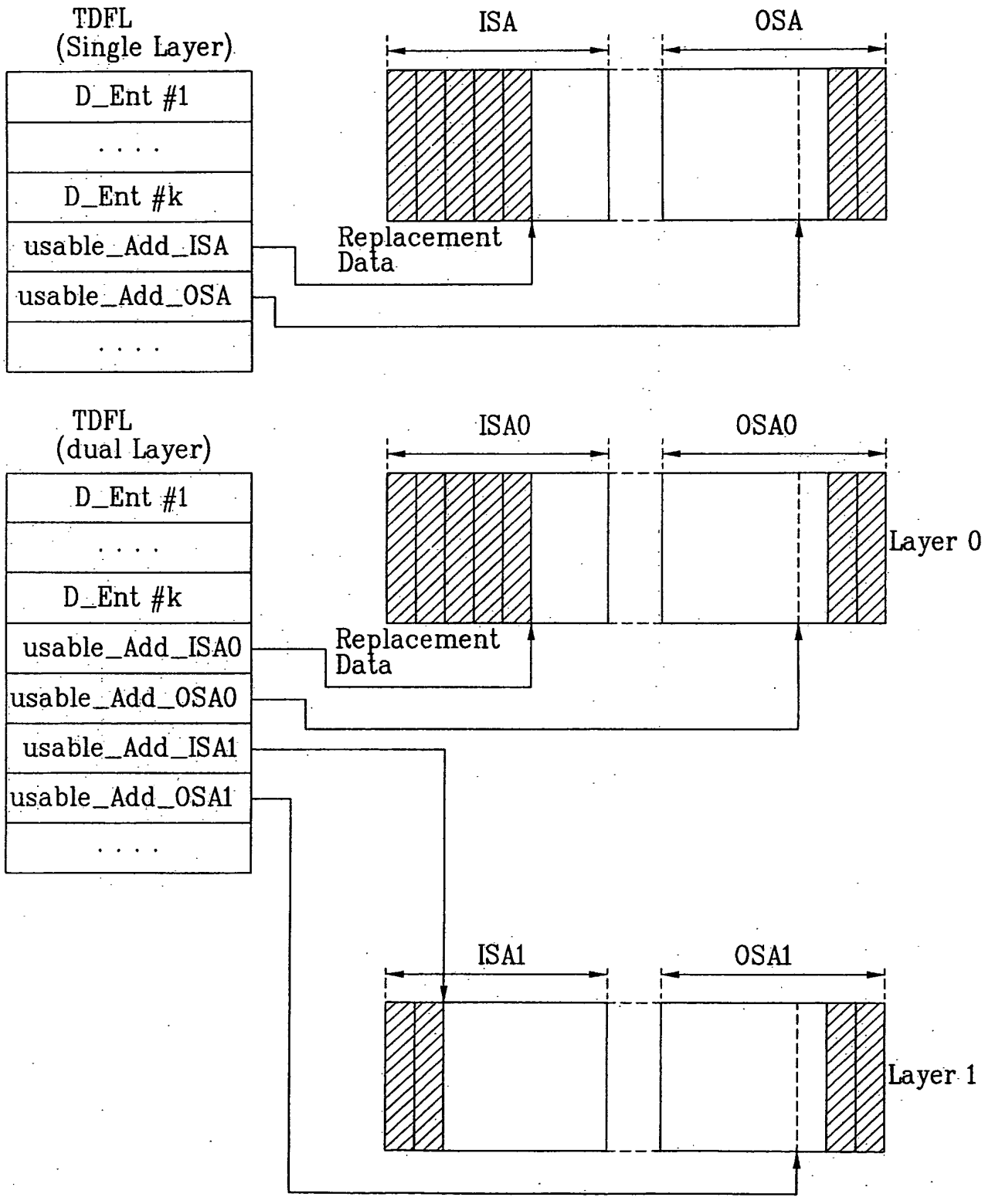

TDDS #K
PSN of TDFL #K
1st_usable_ISA0_cluster
1st_usable_OSA0_cluster
1st_usable_OSA1_cluster
1st_usable_ISA1_cluster
Dual Layer
User Data Area
LSN=0
ISA0
OSA0
Layer 0
Last LSN
User Data Area
ISA1
OSA1
Layer 1

FIG. 16


TDFL
(Single Layer)
D_Ent #1
. . . .
D_Ent #k
usable_Add_ISA
usable_Add_OSA
. . . .
ISA
OSA
Replacement
Data
TDFL
(dual Layer)
D_Ent #1
. . . .
D_Ent #k
usable_Add_ISA0
usable_Add_OSA0
usable_Add_ISA1
usable_Add_OSA1
. . . .
ISA0
OSA0
Layer 0
Replacement
Data
ISA1
OSA1
Layer 1